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AFRICA.—*African News.*—Dr. Oscar Lenz was sent by the Imperial Geographical Society of Vienna to explore the watershed between the Nile and the Congo. He started in May. ——The Austrian explorers, Dr. Paulitschke and Dr. von Hardegger have returned from the Gallas country. They were amicably received by the Egyptian governor of Harrar. On their return (March 25, 1885) they found Zeila half in ruins.——A government commission has inspected and reported upon the Tunisian forests. In the districts south of the Medjerda valley the so-called forests are a mere brushwood with groups of larger trees, but on the Krumis mountains to the north, exist magnificent forests with trees equal in size to those of France, including cork trees and *Quercus mirbockii.* One forest covers 100,000 hectares.

GEOLOGY AND PALÆONTOLOGY.

THE MAMMALIA OF THE OLIGOCENE OF BUENOS AYRES.[1]—This memoir, by M. Ameghino, is one of much importance to the history of the Mammalia, and especially to the history of the Pampean and recent faunæ of the neotropical realm. Ever since M. Bravard announced the existence of species of Palæotherium and Anoplotherium in strata within the limits of the Argentine Confederation, the curiosity of palæontologists has been awaiting an explanation of a statement apparently so at variance with the known facts of the science. M. Ameghino, aided by the labors of Professor Scalabrini, has fortunately resolved this problem, and with it has set before us a record of uncommon interest to the students of the Mammalia and of their evolution.

The strata which have yielded the collections studied, are situated on the Parana river. The number of species obtained is sixty-two, which are referred to forty genera, which are distributed into orders as follows: Cetacea 3; Carnivora 3; Artiodactyla 2; Perissodactyla 5; Toxodontia 4; Rodentia 11; Edentata 17. Of these forty genera, sixteen also occur in the Pampean fauna.

Of these forms it is not to be supposed that all have been fully elucidated and their places finally ascertained. This is especially true of the ungulate orders, where the much-needed determination of the foot structures has not yet been made. We may therefore wait until this is done before accepting the reference of the genus Brachytherium Amegh. to the Anoplotheriidæ, or Ribodon Amegh. to the Tapiridæ. The references of the other genera to families characteristically Pampean, is so highly probable as to require less exhaustive demonstration to command belief. It is in these groups that the most interesting contributions to the history of the evolution of the well-known Pampæan genera have been made. Thus a series is traced backwards in time from Toxodon, which shows that in the more ancient types the dentition was less rodent-like, since the molars were shorter and the canines larger. This adds evidence to the opinion which the writer has reached, that rodent-like types are not primitive but derivative.[1] Protypotherium is believed by Ameghino to be the ancestor of Mesotherium. Scalabrintherium stands in the same relation to Macrauchenia. As to the Edentata, the cases of evident ancestral relation are numerous, and are expressed in such names as Promegatherium Amegh., Promylodon Amegh., Palæhoplophorus Amegh., and Protoglyptodon Amegh. Perhaps the most interesting fact in this connection is the existence of more or less enamel in bands on the teeth of the gravigrades of this formation, proving that the history of the dentition of the Edentata has been one of degradation, as the writer had already concluded before reading M. Ameghino's memoir.[2] This fact is confirmatory of the theory of descent of the Edentata from the Tæniodonta, proposed by myself in 1877.[3]

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[1] Nuevos Restos de Mamiferos Fósiles Oligocenos Recogidos por el Prof. Pedro Scalabrini y pertenencientes al Museo provincial de la Ciudad del Parana; por Florentino Ameghino. Buenos Ayres, 1885, pp. 204. (Extract from the Bulletin Nat'l Academy Sciences, Cordoba, VIII, p. 5.)

The rarity of Carnivora in this formation is remarkable, there being but two terrestrial forms, Cynonasua Amegh. and ? Arctotherium. The rodents are remarkably numerous, twenty-one species being described. Important among these is the genus Megamys, which includes the largest species of the order, *M. patagoniensis* Laur., and which Ameghino places in the Chinchillidæ. Twelve of the species are referred to the Caviidæ.

We do not understand the ground of reference of this formation to the Oligocene. The cacophony of many of the new names proposed is somewhat surprising. The Latin languages of Europe are the most euphonious, but some of the naturalists of those races appear in latter years to have forgotten their cunning.

The further elucidation of this fauna, by so able an anatomist as M. Ameghino, will be awaited with much interest.—*E. D. Cope.*

ON THE GAMPSONYCHIDÆ, AN UNDESCRIBED FAMILY OF FOSSIL SCHIZOPOD CRUSTACEA.[4]—The opportunity of examining at my leisure about a dozen specimens of *Palæocaris typus* of Meek and Worthen, kindly afforded me by Messrs. R. D. Lacoe and J. C. Carr, has enabled me to work out some characters of this genus not mentioned by the original describers. The study of these specimens has led me to compare the genus with Gampsonyx, and the result has led to the formation of a family or higher group for the two genera, which should probably stand at the base of the Schizopoda, while also serving to bridge over the chasm existing between the thoracostracous suborders Syncarida and Schizopoda.

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[1] See NATURALIST, 1885, p. 347, for the origin of the Rodentia from the Tillodonta, etc.

[2] See NATURALIST, 1885, p. 352, and 1884, p. 1257.

[3] Report Expl. Surv. W. 100 Mer., G. M. Wheeler, IV, pt. II, p. 158.

[4] Read at the April meeting of the National Academy of Sciences.

Palæocaris was first described by Messrs. Meek and Worthen in the Proceedings of the Academy of Natural Sciences of Philadelphia, 1865, p. 48, from specimens occurring in claystone nodules in the lower part of the true coal measures, at Mazon creek, Morris, Grundy county, Illinois. Afterwards in the third volume of the Report of the Geological Survey of Illinois, 1868, the same authors figured the fossils and expressed themselves as follows regarding its affinities: "Hence it would seem to present something of a combination of decapod (macruran) and tetradecapod characters. That is, it possesses the caudal appendages, anteriorly-directed thoracic legs, the antennæ (some of the specimens appear also to show basal scales to the outer antennæ), and general aspect of a macruran, with the distinct head, divided thorax (without a carapace) and seven pairs of thoracic legs of a tetradecapod. We have not been able to see its eyes, but from its other decapod characters, and its analogy to Gampsonyx, which is said by von Meyer to have pedunculated or, at any rate, movable eyes, we are strongly inclined to believe that our fossil will be found to agree with Gampsonyx in this character also.

"It therefore becomes a matter of interest to determine to which of the subclasses, decapods or tetradecapods, it really belongs. That it belongs rather near Gampsonyx, though not to the same subordinate section (Schizopoda), there can be little doubt. Hence these two forms apparently fall naturally into the same family. Professor Jordan and Mr. Meyer seem to have regarded Gampsonyx as a tetradecapod, connected with the Amphipoda, but also possessing macrural decapod affinities. Professor Dana, however, regards it as a low type of Macrura belonging to the section Schizopoda. He and Dr. Stimpson, to whom we sent sketches of our better specimens of Palæocaris, concur in the opinion, judging from all its characters yet known, that it is a low embryonic type of the Macrura, in which the carapace is not developed.

"Generically it is separated from Gampsonyx, figures of which (cuts *C* and *D*) we have added for comparison, not only in the nature of its caudal appendages, but in the more important character of having its thoracic legs simple, and not bifid as in the Schizopoda."

In our specimens we were able to detect well-marked narrow lanceolate oval breeding lamellæ on eight pairs of appendages.

It should be observed that the breeding lamellæ are in part represented in Meek and Worthen's figure, but not referred to in their description; they are also partly represented in their copy of Jordan and Mr. Meyer's figure of *Gampsonyx fimbriatus;* in the latter there is also present what is apparently a large coarsely-spined mandibular palpus, somewhat like that in the male of the existing deep-sea schizopod, *Petalophthalmus armatus*, described by Willemoes-Suhm.[1] In the females, however, the palpus is small and unarmed, and it is probable that all my specimens of Palæotypus are females, since most of them have breeding lamellæ. In the figure of Gampsonyx referred to, the thoracic legs themselves, irrespective of the breeding lamellæ, are represented as biramous, and the two rami are drawn as of nearly equal length; it is probable that there has been a mistake in drawing the legs, as in none of the existing schizopods, such as Mysis and allies, Euphausia, Gnathophausia, Petalopthalmus or Chalaraspis, are the legs thus thrice divided. It is to be hoped that the fossil itself will be examined anew with regard to this important point.

It is sufficiently evident, however, that Gampsonyx and Palæocaris are closely allied forms, and as suggested by Messrs. Meek and Worthen, should fall into the same family, which may be called Gampsonychidæ. The principal character which separates this group from all other schizopods is the entire absence of a carapace.

It is worthy of notice, however, that the size of the carapace is very variable in the Schizopoda, and in the genus Petalophthalmus there is a great discrepancy in the two sexes; in the female it covers the entire thorax, while in the male it is remarkably small, subtriangular, leaving the two hinder thoracic segments entirely exposed, as well as the sides of the two segments in front. In the large size and oval-lanceolate shape of the breeding lamellæ, both of the gnathopods (maxillipedes) and thoracic feet, the Gampsonychidæ agree with Petalophthalmus, in which they are large and broad. In the shape of the telson and the comparative size and proportions of the last pair of abdominal appendages there is a close relationship in the Gampsonychidæ to the schizopod genera Petalophthalmus and Chalaraspis, especially the latter genus, in which the telson is rounded at the end, while the two rami are more as in Petalophthalmus, though broader. The other biramous abdominal appendages in the Gampsonychidæ are truly schizopodal.

Classifying the Schizopoda by the carapace, there would seem to be three groups, as follows:

I.	Carapace absent	*Gampsonychidæ.*
II.	Carapace free, varying in size	*Gnathophausia. Petalophthalamus, Chalaraspis.*
III.	Carapace fastened to the thorax	*Mysis, Lophogaster, Cephanoia.*

But I should agree with Willemoes-Suhm that this is not a natural genealogical classification, and throwing out the Nebaliadæ, which we have endeavored to show belong to a distinct order of Crustacea, the families of schizopods may be enumerated thus, all having seven abdominal segments:

Carapace absent, 6 pairs of thoracic legs	I.	*Gampsonychidæ.*
Carapace well developed, 6 pairs of thoracic legs	II.	*Mysidæ.*
" " " 8 " " "	III.	*Euphausiidæ.*
" " " 4 " " "	IV.	*Chalaraspidæ.*
" " " 7 " " "	V.	*Lophogastridæ.*

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[1] On some Atlantic Crustacea from the *Challenger* expedition. By Dr. R. von Willemoes-Suhm. Linnæan Transactions. Zoölogy. Vol. I, p. 23, 1874.

When we compare the Gampsonychidæ with the Syncaridæ (Acanthotelson), we see that both groups have the same number of body-segments, and that both lack a carapace; and thus while the Gampsonychidæ are the ancestors of living schizopods, the group as a whole probably descended from Acanthotelson, which is thus a truly synthetic form, standing in an ancestral relation to all the Thoracostraca, while it also suggests that the sessile-eyed and stalk-eyed Crustacea may have had a common parentage.

GEOLOGICAL NEWS.—*Silurian.*—Various studies by W. C. Brogger, upon the Silurian strata of Norway and their contained fossils, are published in the Magazin fur Naturvidenskaberne, Christiania, 1878–1882–1884, and furnish new data for a comparison between the Scandinavian, German and English Silurian.

Devonian.—P. Wenjukoff has published (in Russian) a work upon the Devonian strata of European Russia, with a table of comparison with the beds of Belgium and Eifel. It appears that the Russian beds belong to the Middle and Upper Devonian.

Carboniferous.—MM. B. Renault and E. E. Bertrand have found incontestable proof of the existence of fungi in Carboniferous times. In the tissue of the seed of a conifer of this epoch (*Spherospermum oblongum*) the mycelium of a fungus was found, consisting of threads which were lengthened out or irregularly bunched together, according to the size of the cellules in which they were developed. The cellules of the hypla may be entirely or totally transformed into sporangia, in the latter case the part which touches a sporangium is furnished with a cuticle. Two sporangia are often thus separated by a cuticle cellule. The sporangia are ovoid, are swollen upon the side of the orifice. They are usually empty. The Grilletia are thus remarkable for their sporangia without a neck and without an operculum, and for their habitat in the seeds of gymnosperms. They must be placed near Aphanistis, Catenaria and Ancylistis.——The annals of the Belgium Royal Museum of Natural History, 1883, contain the fourth part of De Koninck's studies of the fauna of the Carboniferous Limestone of Belgium. This part is devoted to the Gastropods. Among new species are numerous Calyptræidæ, four of Helminthochiton, four Dentaliidæ and a small Hyolithes.

Mesozoic.—M. Bleicher (Bull. Soc. Geol. de Fr.) gives a stratigraphical study of the iron beds of Lorraine, belonging to the Upper Lias and Lower Oolite. From a comparison it appears that there is a great agreement between these beds in France and Germany and the corresponding ones in England.——M. Neumeyer (Denksch. d. kais. Acad. Wien, 1883) contributes his views upon climatic zones during the Jurassic and Cretaceous periods. In the first chapter, "Theory of the Climate of the Past," he combats the usual idea that before the beginning of the Tertiary the entire earth enjoyed an equable warm temperature through the influence of the interior heat. In the next chapter is brought together all previous knowledge of climatic zones in Jurassic times, and the next treats of the characteristics of an Alpine Jura and a mid-European Jura. This is followed by a chapter upon the distinguishing features of an Alpine and a Mediterranean Neocomian. He finally thus classifies the zoögeographical provinces of Jurassic and Cretaceous times:

I. Boreal Zone.

1. Arctic province.
2. Russian “
3. Himalayan “

II. North Temperate Zone.

1. Mid-European province.
2. Caspian “
3. Punjab “
4. Californian “

III. Equatorial Zone.

1. Alpine (Mediterranean) province.
2. Crimo-Caucasic “
3. South Indian “
4. Ethiopian “
5. Columbian “
5*a*. Caribbean “
6. Peruvian “

IV. South Temperate Zone.

1. Chilian province.
2. New Zealand “
3. Australian “
4. Cape “

Tertiary.—Numerous plant impressions, together with remains of *Sus major*, *Hipparion gracile*, *Castor jægeri*, etc., have been found in the lignite beds which are interstratified with the lower layers of the Miocene of Cerdagne, an ancient lacustrine basin on the southern slope of the Pyrenees.——F. Fontannes writes of a new exposure of Miocene strata near Lisbon (Portugal), and describes the fossils found there, including a species of swimming-crab (*Achelous delgadoi*), the first representative of this tropical genus yet found in the Miocene. It occurs abundantly in the strata containing *Venus ribeiroi*.——“The classification and palæontology of the United States tertiary deposits.” Under this head a note has been published in the number of June 12, of this journal, on the first part of my article, “The genealogy and the age of the species in the Southern Old-tertiary,” *American Journal of Science*, June, 1885. I refer those readers of The Naturalist who are interested in this matter to the second part of this article, which will appear in the July number of the same journal.—*Dr. Otto Meyer, Yale College Museum, New Haven, Conn., June 15, 1885.*

Quaternary.—M. Stanislaus Meunier has described a Quaternary flint from the valley of Loing, forty-five mm. in diameter, containing not only a movable nucleus of stone, but a quantity of water. Such cases are well-known among quartz or concretions from amygdaloid rocks, but the example is said by M. Meunier to be unique among flints. The water must have come from the Quaternary bed in which the flint, itself of Cretaceous age, was lying, and must have penetrated the stone by permeating the silex.